A Datapro Feature Report

WORD PROCESSING:
Selected Stand-Alone Printing Systems

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IBM Mag Card Typewriters

MANAGEMENT SUMMARY

When IBM announced the first member of its magnetic card typing system family–the Magnetic Card/Selectric Typewriter (MC/ST) or "Base Mag Card" – in October 1969, it appeared that a reverse step in word processing had been taken by the computer giant. For this simple unit-record magnetic card system was released almost five years after IBM's first automatic typing system – the Magnetic Tape/Selectric Typewriter (MT/ST) – using more advanced sequential magnetic tape for data storage.

But, in fact, IBM responded to marketplace demands for a system that combined the power of the magnetic recording and automatic playout of the MT/ST with a page-oriented media that would be easier for the typist to conceptualize. It is no coincidence that IBM's next four automatic typewriter announcements were based on widely accepted magnetic card storage (the same card can be used interchangeably in all models), and that the seemingly more sophisticated tape systems are no longer in production. In fact one IBM magnetic keyboard entry unit – the Memory typewriter released in March, 1974 – is media-less to all outward appearances, with no removable media at all (text recording occurs on an internal, non-changeable belt).

While the basic contemporary automatic typewriter market is overwhelmingly aimed at direct replacement of existing electric typewriters, the earlier MT/ST's proved to ▷

The Mag Card/A (MC/A) – the newest member of IBM's family of mag card word processing typewriters.

With an installed base estimated at some 170,000+ units, IBM's mag card typewriters set the price-performance norms for the industry. The family offers basic word processing functions, and employs page-oriented cards for storage – a medium that is easy to understand and implement into office operations. Principal applications of mag card keyboards is in standalone-mode, entry/edit and then print situations. However, the introduction of IBM's 46/40 mag card printer system (see Report S13-491-501) enhances and expands mag card typewriter applications to clustered typewriter key-to-card and printer card-to-print high volume tasks.

CHARACTERISTICS

MANUFACTURER: International Business Machines Corporation, Office Products Division, Parson's Pond Drive, Franklin Lakes, New Jersey 07417. Telephone (201) 848-1900 or local offices. In Canada: IBM Canada Ltd., 1150 Eglinton Avenue East, Don Mills, Ontario M3C 1H7. Telephone (416) 443-2111 or local offices.

MODELS: IBM Mag Card Selectric Typewriter (MC/ST-I); IBM Communicating Mag Card Selectric Typewriter (CMC/ST); IBM Mag Card Executive Typewriter (MC/ET); IBM Mag Card II Selectric Typewriter (MC/ST-II); IBM Mag Card/A Typewriter (MC/A).

TYPEWRITER

KEYBOARD: Each of the IBM mag card systems employs a standard 44-key alphanumeric keyboard layout that provides up to 86 different characters and space (both period and comma are repeated in upper and lower case). Each keyboard also has five repeating keys – carrier return, index, space, backspace and hyphen/underscore. A backspace command on the MC/ST-II and the MC/A will also activate a lift-off tape and erase the contents of typewriter memory in an automatic mode of operation, or will perform similar functions under operator control in a typewriter mode.

CONTROL KEYS: In addition to an On/Off switch, each mag card typewriter has nine basic keys to control basic typing functions (margin release, tab, backspace, index, carrier return, tab set/clear, shift, and shift lock).

Word processing functions are implemented on IBM mag card typewriters by a number of dedicated control keys located to the right and left of the main alphanumeric keyboard, and by compound code key plus alpha or control key commands.

MC/ST-I, CMC/ST & MC/ET CONTROL KEYS

CONTROL KEY	FUNCTION
REC (Record)	Records keyed text onto card.
PLAY (Playback)	Implements card playback in conjunction with AUTO, LINE, WORD or CHAR keys.

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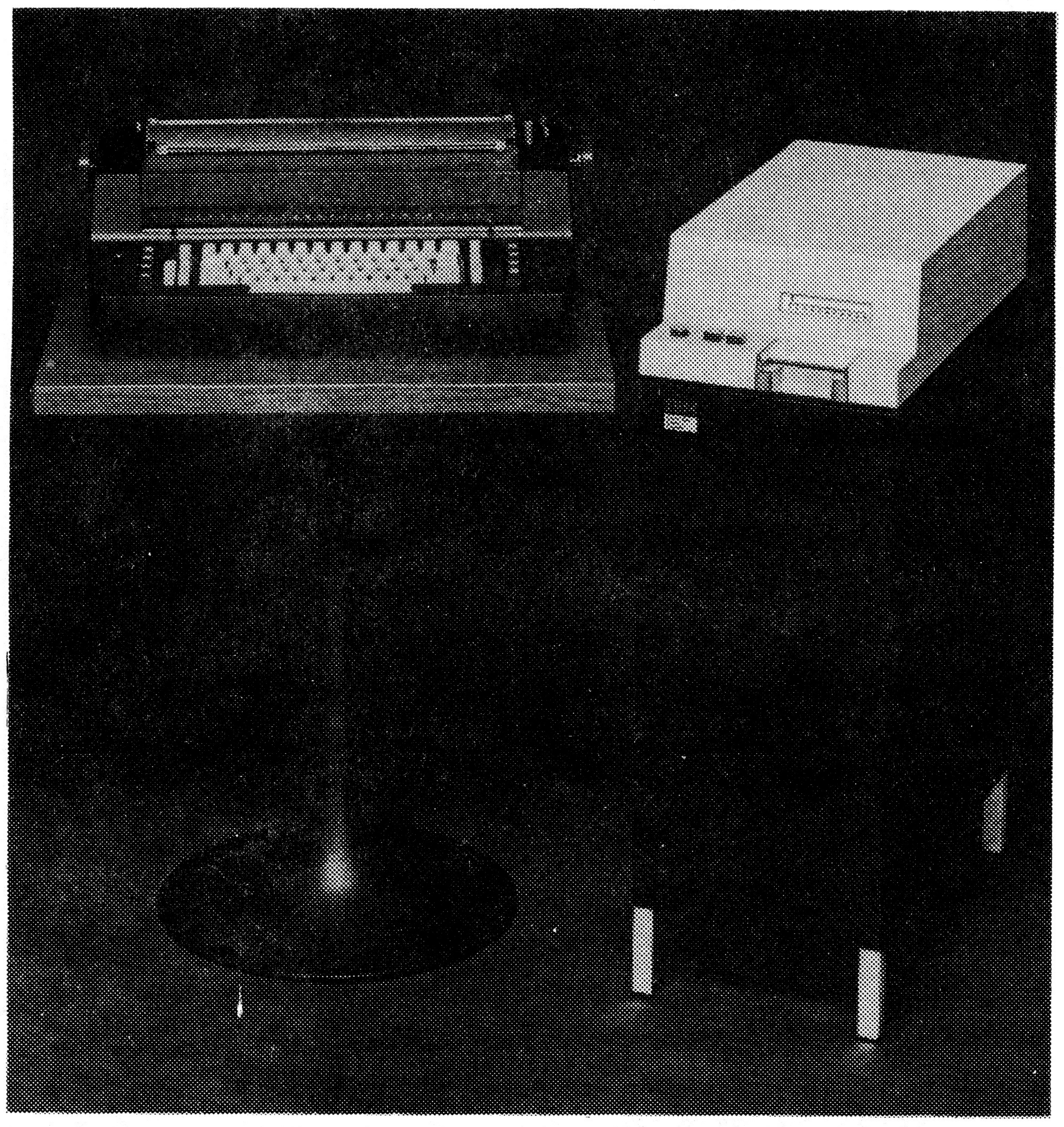


IBM Mag Card Selectric Typewriter (MC/ST-I)

be complex and awkward enough to require extensive operator training. The specialized MT/ST operator skills outweighed the original general-purpose secretarial skills of the would-be operators, and effective use of the MT/ST's was no longer incidental to the traditional secretarial background. Specialization became necessary for use of the MT/ST's, and the tape-oriented MT/ST systems tended to be installed not at the huge number of individual secretarial typing stations currently found in most companies, but rather in centralized pools. In this type of word processing environment the systems could no longer be considered direct electric typewriter replacements, and entailed organizational changes, specialized training, and a generally new way of doing business.

Thus, the MC/ST with its more natural feel and significantly easier operator learning curve was a much

Proportional-Spacing IBM Mag Card Executive Typewriter (MC/ET)

ADJ (Adjust)	Implements special card pla back where carrier return activated by entering a Carri Return Zone rather than coded carrier returns. Allows f changes in line length to fit new copy.
SKIP	Implements special card pla back where text may be omitte from playback printout witho changing text recorded on car Also works in conjunction wit AUTO, LINE, WORD or CHA keys.
AUTO	Implements card playback unt a Card Eject code is read or th CHAR/STOP key is depresse
LINE	Implements card playback on line at a time basis.
WORD	Implements card playback on word at a time basis.
CHAR/STOP	Implements card playback on character at a time basis, o stops all playback operations.

The mag card read/write station employed with the MC/ST-I, CMC/ST and MC/ET also has control keys fo selecting particular card tracks (lines). Such controls move track selector to higher or lower numbered tracks i conjunction with a visual 0-to-50 track pointer display.

The CMC/ST has additional communications-oriented control keys for implementing transmission start, attention/end interrupt, CPU (computer transmission) and line hold (pause) commands. The MC/ET also has a Space Expand key for aligning numerical columns during proportionally spaced typing.

MC/ST-I, CMC/ST & MC/ET COMPOUND CODE KEY COMMANDS

COMMAND	FUNCTION
CODE + TAB	Required Tab instruction for paragraph indents, etc., and for setting up temporary left margins.
CODE + 1	Card Repeat instruction for continuous playback of card text. System returns to the first card track and begins playback.
CODE + 3	Card Eject instruction for ending a message and ejecting the card.
CODE + 5	Delete instruction for deleting a character at a time.
CODE + 7	Track Link instruction for deleting an entire card track.
CODE + 9	Stop instruction for stopping playback at any point on the card.
CODE + –	Required Hyphen instruction for ensuring that hyphens or dashes are typed during playback.

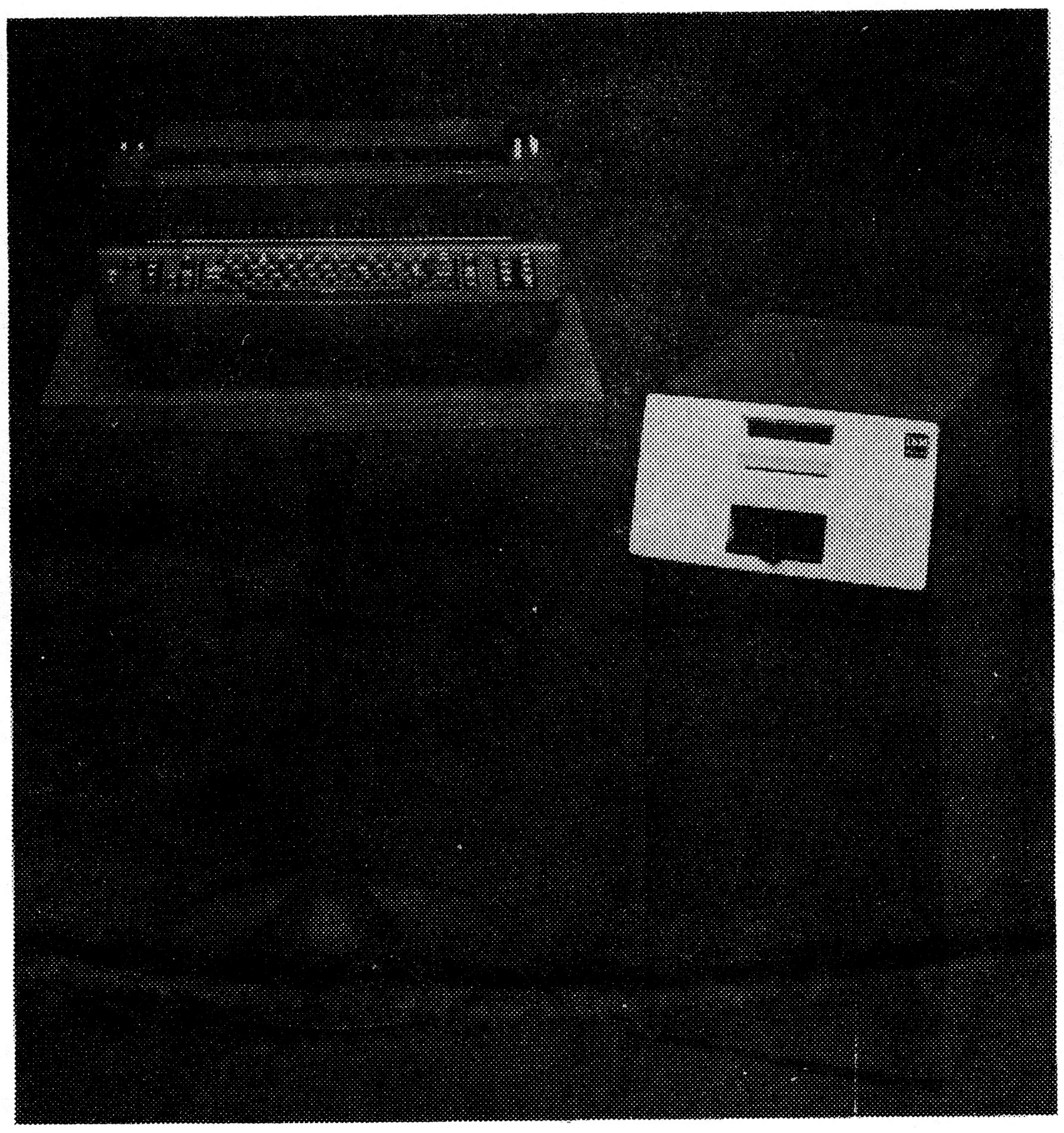
more likely product to penetrate the vast electric typewriter replacement market. The magnetic card word processing systems would be used at individual typing stations rather than in specialized pools. A correspondingly higher number of units have, therefore, been installed.

The original MC/ST was followed in July 1971 by the Communicating Magnetic Card (CMC) system, which consisted of a Base Mag Card System with a $55 per month communications option added. The unit is a "casual" timesharing station that looks like an IBM 2741 Terminal to another similarly equipped CMC or to a computer.

In April, 1972, IBM released the MC/ET or "Exec Mag Card" typewriter. The unit was based on the single-element (type "ball"), proportional spaced Executive Typewriter. Note that the original Executive was released as a typebar typewriter in 1940, while the first single-element Executive appeared in the stand alone Selectric Composer in 1964. Although relatively few MC/ET's have been sold, the high quality appearance of the typed output cannot be exceeded by any unit available today. Indeed, the professional looking appearance of the Executive typewriter's output is more than for mere aesthetic purposes. Studies by IBM indicate that reading speed is increased about 6 percent for proportionally spaced type as contrasted with uniformly spaced Pica or Elite typing.

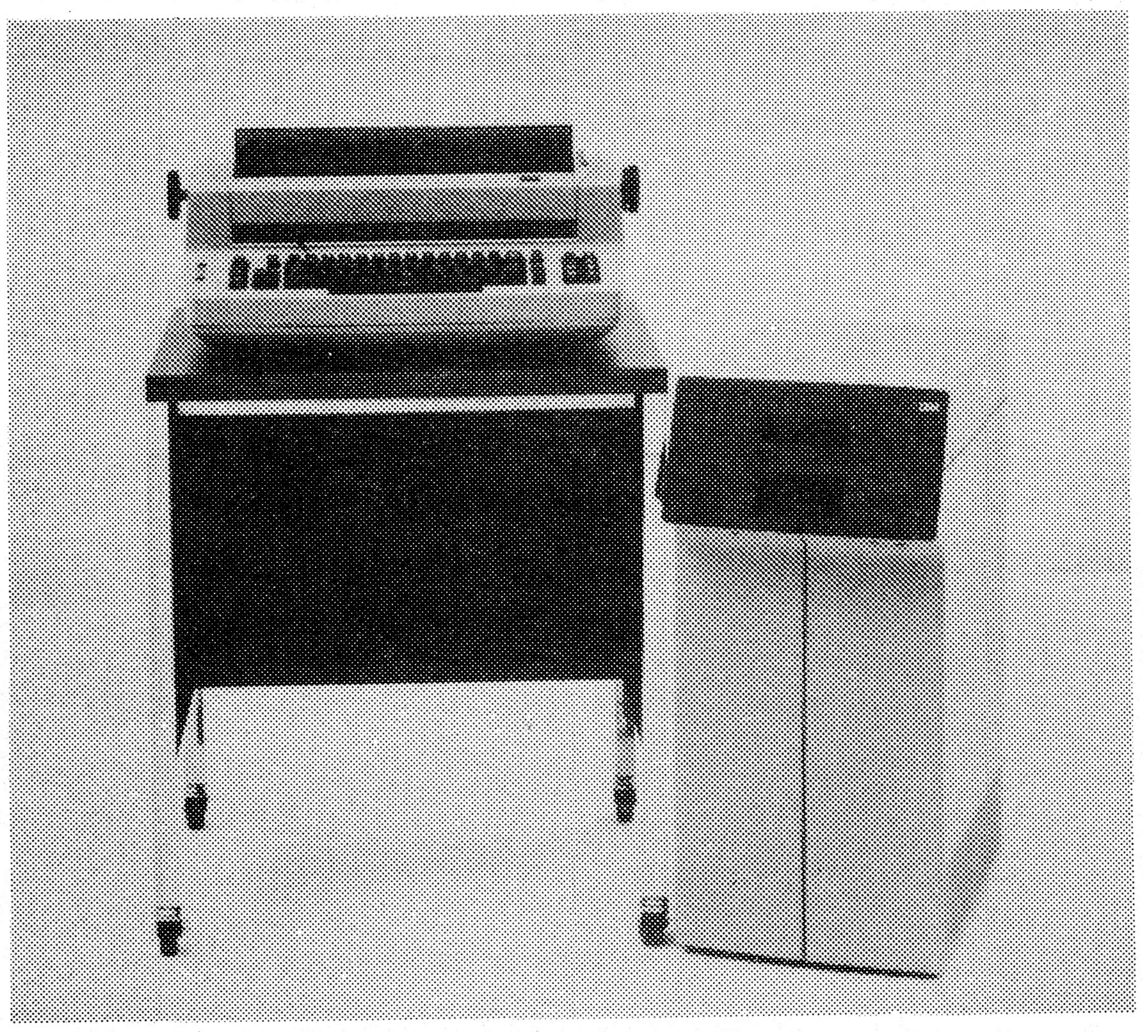
The MC/ST-II or Mag Card Two was announced by IBM in April, 1973, and is IBM's current top of the line model. Based on a Correcting Selectric, dual (10 and 12) pitch typewriter, the system features mag cards plus an 8000 character internal memory.

The new (September, 1975) Mag Card/A Typewriter (MC/A) fits between the Memory typewriter and the MC/ST-II in IBM's price-performance hierarchy, and reiterates IBM/OPD's commitment to page-oriented magnetic card media. To some extent, the MC/A might be viewed as a Memory Typewriter with removable storage media, making the system attractive to many single station users who need additional storage capabilities or the ability to prepare text on one unit for playback on another, two problem areas not solvable with the Memory Typewriters. The MC/A shares the Memory Typewriter's ability to be employed in a secretarial environment as well as in a word processing facility, but also shares the problem of being unable to handle merging tasks. The single card reader/recorder of a MC/A is used to store text that has been keyed and edited via the internal typewriter 6000-character memory. Text stored on cards can be transferred into or out of memory, but otherwise no other switching between card and memory is possible. The MC/A can, however, encode switch codes which are compatible with MC/ST-II units, and can be employed as a preliminary text entry and editor for such models. The MC/A should appeal to users who are enamored by the MC/ST-II but do not require the II's merging capabilities ▷

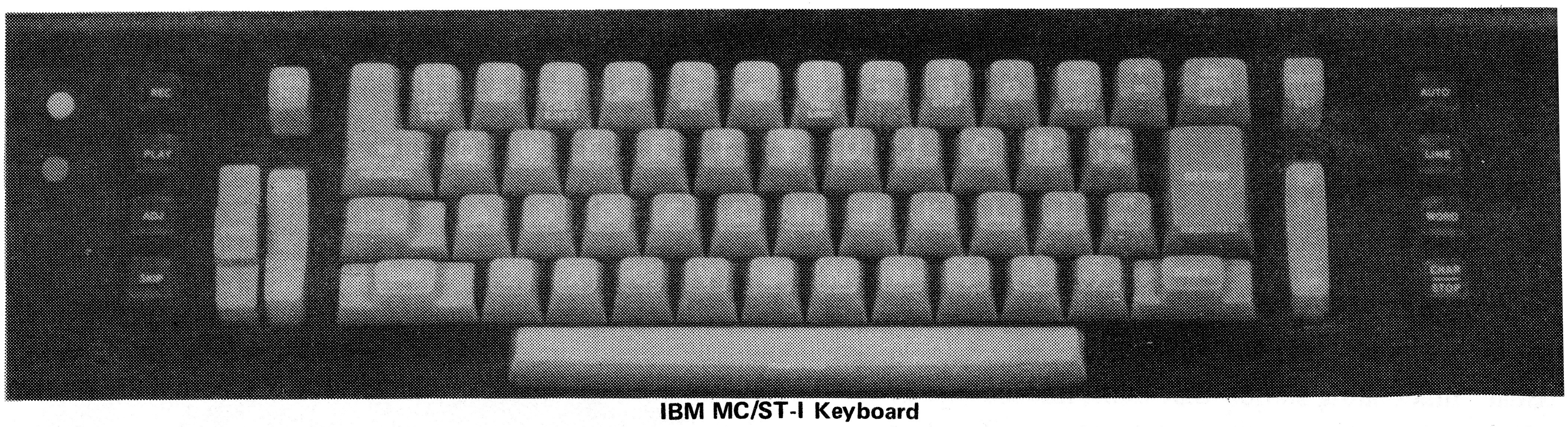


IBM Mag Card II Selectric Typewriter (MC/ST-II)

➤	CODE + BACK SPACE	Required Back Space instruction for moving the typewriter carrier back but allowing the card to index forward. Used to underscore without erasing characters.
	CODE + INDEX	Index Return instruction for returning the typewriter carrier to the left margin. Used to ensure that each new document begins on the left margin and that copy lines remain in parity with card tracks.
	CODE + RETURN	Required Carrier Return instruction for ensuring that a carrier return is not treated as a space during ADJUST playback. Used with short lines, names and addresses, etc. ➤



IBM Mag Card/A Typewriter (MC/A)



IBM MC/ST-I Keyboard

or cost; indeed, it has been reported (by non-IBM sources) that some MC/ST-II users are down-grading to the Mag Card/A to save money. The A's media compatibility with other IBM card models should also see this unit applied as an input terminal in mixed II or CMC/ST installations.

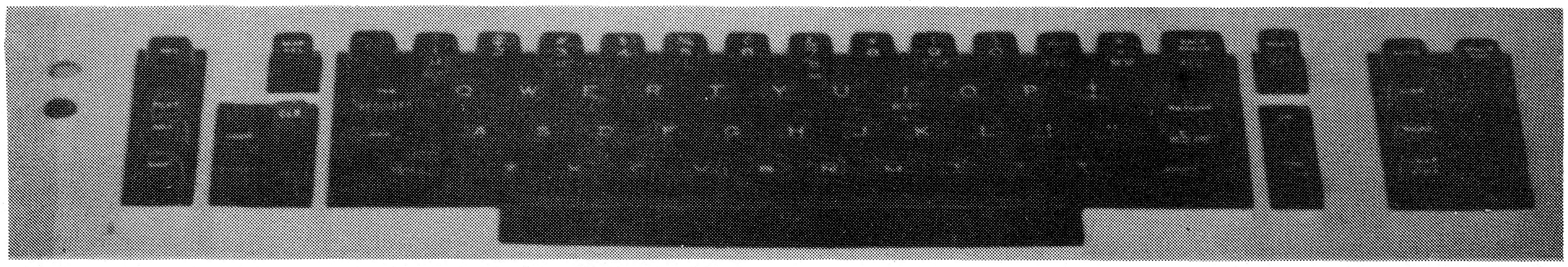
Fundamentally, magnetic card unit record systems are designed to handle an unlimited number of short documents, each characteristically not more than several pages long. Such units operate best in an environment where emphasis is on repetitive typing and personalized form letters with relatively minor attention to heavy text editing applications. Where editing is required, the magnetic card systems are best suited to producing an operator-specified sequence of previously prepared text passages while deleting unnecessary material during operator attended operation. Extensive and/or permanent restructuring of a recorded text will require re-keying in the MC/ST, CMC/ST or MC/ET. Such changes can be made in internal memory on the MC/ST-II and MC/A and automatically written in the revised form onto magnetic cards.

Each magnetic card holds 50 lines of text and corresponds both logically and physically to a separate hard copy (printed) page. Although the MC/ST-II provides for an input stack of up to 50 magnetic cards (theoretically allowing for a 50-page document), text editing can prove cumbersome if it involves more than one card alterations. On systems other than the MC/ST-II and MC/A, text inserts that cause an individual printed line to overflow to the next line can in turn cause spillover to the following line, etc. One way (not offered by IBM) of compensating for insertion/deletion problems using magnetic cards would be to have two card stations; the contents of one card could be copied onto another card insofar as possible to create a revised version of the text. This is a common approach for most non-IBM text-editing magnetic card

CODE + SPACE	Required Space instruction for ensuring that spaces are not read as carrier returns in ADJUST playback. Used with dates, names, addresses, etc.
CODE + i (MC/ET only)	Word Underscore instruction for automatic underlining.
CODE + = (MC/ET only)	Backspace 1 instruction for backspacing in machine increments rather than by a character (character width varies with each specific character on a proportional typewriter).

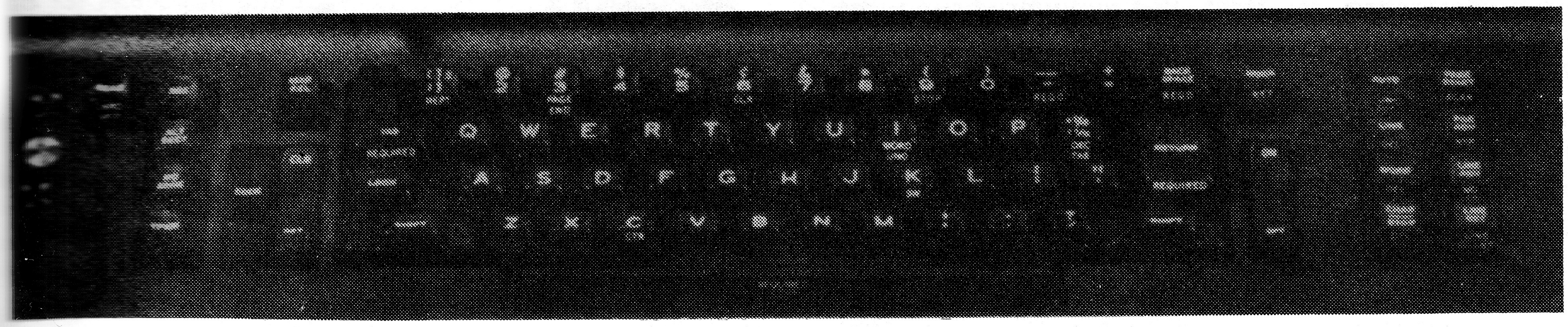
MC/ST-II & MC/A CONTROL KEYS

CONTROL KEY	FUNCTION
REC (Record)	Records keyed text stored in typewriter memory onto a card.
READ	Transfers or reads text stored on a card into typewriter memory.
ALT SECT (Alternate Section) (MC/ST-II only)	Partitions typewriter memory into two sections. Constant text is read into main section memory, and variable text into the alternate section. Provides means for performing automatic letter writing and other repetitive text plus variable data typing tasks.
NO ZONE	Allows playback printing of text exactly as it was initially keyed. Used for typing tabular material without changing line lengths.
TPWR (Typewriter)	Enters keyed text into memory when in an "up" position. Locks out keyboard and allows text transfer from memory to cards without erasing memory when in a "down" position.



IBM MC/ET Keyboard

IBM Mag Card Typewriters



IBM MC/ST-II Keyboard

systems. Another approach for easier handling of longer documents and heavy text editing is to use dual serial (tape) or single random (disc) media. The tape approach is, of course, available on the older MT/ST tape units and on a number of non-IBM systems. Disc media is becoming rapidly more popular in high-end systems, particularly for long document editing, but is not currently available from IBM.

The IBM MC/ST-II, with its 8000-character internal memory offers the ability to hold at least two pages of text in an accessible or fluid form at one time. This system permits powerful manipulative text editing to be exercised by the operator in a simplified, straight-forward manner for documents that typically do not exceed 2 or 2-½ typed pages. The MC/ST-II thus is very similar to the new Memory Typewriter, and appears to be the best bet in the IBM magnetic keyboard lineup for extensive text editing of short documents. Longer documents are still more easily handled, both from a length as well as a text editing point of view, by the MC/ST-II than by other IBM magnetic card word processing systems.

Originally, IBM sold its magnetic card systems as being most applicable to the large center situation, in conjunction with other equipment (central dictation and copiers) to provide efficient production of typed material. Lately, IBM has revised its thinking on large centers and feels that many users may be better served by establishing smaller centers, in departments or work groups, in order to most efficiently handle the needs of the office as it exists today.

In June, 1976 IBM announced several new word processing products which may be used in conjunction with mag card installations, and especially with multiple unit installations. The IBM 46/40 Document Printer allows text recorded on mag cards to be printed off-line at speeds of 77 to 92 characters per second via a high quality ink-jet printer. The unit includes sheet paper (choice of two sizes or types) and envelope feeds and stackers, and

AUTO	Implements playback from memory until the end of the document.
LINE	Implements playback from memory until a carrier return (line at a time playback).
WORD	Implements playback from memory until a space, tab or carrier return (word at a time playback).
CHAR/STOP	Implements playback from memory on a character at a time basis, or stops all playback operations.
PAGE START	Positions system back to text at the start of memory or to text following last Page End instruction code.
PAR ADV (Paragraph Advance)	Positions system to the beginning of the next paragraph in memory.
LINE ADV (Line Advance)	Positions system to the beginning of the next line in memory.
LINE RET (Line Return)	Positions system to the beginning of the previous line in memory.

MC/ST-II & MC/A COMPOUND CODE KEY COMMANDS

CODE + READ	Card Skip instruction for ejecting card from read/write station without changing the contents of typewriter memory.
CODE + TAB	Required Tab instruction for paragraph indents, etc., and for setting up temporary left margins.
CODE + 1	Repeat instruction for continuous printing of text stored in memory. Automatically positions system to beginning of memory.

IBM MC/A Keyboard

can run/unattended. In effect, this announcement turns each of the 170,000 (industry estimate) mag card IBM and IBM-compatible systems into an input station for later high-speed output. IBM's General Systems Division also announced the Word Processor/32 in June, 1976. The Word Processor/32 consists of a software package plus hardware enhancements which allows System/32 users to add word processing to their minicomputer's capabilities. The Word Processor/32 is sophisticated, flexible and expensive, with a base system in the $34,000 range. IBM also offers the 5321 Mag Card Unit (MCU) in conjunction with the System/32 WP offering. This unit allows the System/32 to accept text from mag cards and output manipulated text to mag cards, for output on any standalone mag card system or the 46/40 Document Printer.

Naturally, the prospective user will want to acknowledge the fact that IBM's sheer size and strong market position are an important facet of the word processing market. It is largely because of IBM's high asset liquidity that the word processing industry today is a rental business. IBM suggests that this is a good protection to the user against rapid change in a high technology business (a statement that Datapro will readily agree with), but it probably is no coincidence that IBM (according to current industry estimates) has received about a 2- to 3-fold payout on its installed rental/lease base of word processing systems, much to their benefit.

The message seems to be that for users willing to commit to a system for more than 2-½ or 3 years (depending upon model), purchase is likely to be a more cost-effective approach, even when considering IBM's discounted two-year lease (Extended Term lease or "ETL") Plan. Datapro feels that while an initial short term rental can be valuable in a live test of a word processing system, once the decision is made to use the equipment permanently it makes sense to form a purchase commitment of at least 2 to 3 years.

For innovative users, it is noteworthy to observe that a number of independent non-IBM systems are available to interface the magnetic card media to conventional computer systems. Among these is the Digi-Data (8580 Dorsey Run Rd., Jessup, Md. 20794) System 22 that connects to all but the Mag Card II (a Mag Card II version is in development) and produces industry-compatible ½-inch computer tape in 7- or 9-track format with recording densities of 556 or 800 bpi.

Competition for the IBM magnetic card family comes from a variety of sources – chiefly from the mag tape (cassette), and the newer diskette-based systems, especially those with video displays. Now that these systems are approaching the price level of high-end mag card units, competition is likely to be lively. Other systems include time-sharing services and in-house minicomputer-based systems. Each of these alternatives offers a particular strength to certain segments of the word processing marketplace. But the IBM magnetic card machines can

CODE + 3	**Page End instruction for ma ing the end of a page of te The end of a playback page m not necessarily coincide wi the end of text in the memo**
CODE + 6	**Clear instruction for erasing t contents of memory.**
CODE + 9	**Stop instruction for stoppi playback at any point memory.**
CODE + –	**Required Hyphen instructi for ensuring that hyphens dashes are typed during pla back.**
CODE + BACK SPACE	**Required Back Space instru tion for moving the typewrit carrier back without erasin memory; used to undersco columns, to center over decim tab columns, and to ent hanging indents. Also used whe in TWPR "down" mode t correct an error (keyboard usually locked out).**
CODE + INDEX	**Index Return instruction fo returning typewriter carrier t the left margin. Used to ensur that each new document begin on the left margin.**
CODE + RETURN	**Required Carrier Return instruction for ensuring that a carrier return is implemented in playback. Used with short lines, names, addresses, serial numbers, etc.**
CODE + SPACE	**Required Space instruction for ensuring that spaces are not implemented as carrier returns in playback. Ensures that names, addresses, serial numbers, dates, etc. are typed without a return as a single line or phrase.**
CODE + i	**Word Underscore instruction for automatic underlining.**
CODE + !½	**Decimal Tab instruction for automatic alignment of numeric columns on the decimal.**
CODE + k	**Switch instruction for implementing switching between main and alternate sections of memory. Note that this code may be recorded on either the MC/ST-II or the MC/A, but the instruction may only be implemented on the MC/ST-II (see ALT SECT Control Key Function description).**
CODE + c	**Center instruction for automatic centering of a line or phrase.**
CODE + LINE	**Line Delete instruction.**
CODE + WORD	**Word Delete instruction.**

more than hold their own for that great middle spectrum of standard business correspondence found in today's office environments.

Most of this typing can be effectively handled by a wholly internally controlled, stand alone system operated by existing clerical personnel, satisfying the psychological preference for "page-like" unit record card storage media. □

CODE + CHAR/STOP	Character Delete instruction.
CODE + PAR ADV	Right Margin Set instruction for changing line length.
CODE + AUTO (MC/ST-II only)	Unattended Playback instruction for generating forms or letters on the MC/ST-II from card packs onto continuous form paper.
CODE + LINE RETURN (MC/ST-II only)	Line Count instruction for entering the number of lines to be typed per page.

Pilot lamps to the left of the keyboard are employed to indicate mag card typewriter status or possible malfunctions in card input/output procedures.

MC/ST-I, CMC/ST & MC/ET PILOT LAMP DISPLAYS

LAMPS	STATUS/CONDITION
Red	Character did not record or playback.
Yellow & Red	Card track is filled.
Red "on" first, then Yellow as card ejects	Nothing has been recorded on card, or card is dirty.
Yellow	Card has not been loaded, or only one record space remains on card. Will also activate each time text is skipped in SKIP mode operations.

The CMC/ST communicating typewriter has two additional lamps for indicating send/receive status. The MC/ST-II and MC/A add an additional Green pilot lamp to the keyboard; status conditions indicated by the three lamps on these typewriters are as follows:

MC/ST-II & MC/A PILOT LAMP DISPLAYS

LAMPS	STATUS/CONDITION
Green	Card is required to complete the recording of a page from typewriter memory.
Green (blinking)	(1) – Page is recorded on two cards; second card must be read. (2) – Read key was depressed while card was being read.
Yellow	Memory is full and keyboard is locked.
Yellow (blinking)	Memory does not have enough space to store all of the text recorded on the card.
Red	Error code in memory must be cleared by character deletes, and the deleted characters then rerecorded.
Red (blinking)	Card is dirty, or cannot be read correctly, or there is an Error code in memory.
Green & Red (blinking)	Dusty or damaged card.

PRINTER: The printer employed with IBM's mag card series is based upon their popular Selectric replaceable ball typing element mechanism. The MT/ST-I and CMC/ST employ the Model 975 OEM Selectric. The proportional spacing MC/ET uses the Model 965 Correcting Selectric. The MC/ST-II and MC/A both utilize the newer Model 545 Correcting Selectric.

Automatic playback printout typing speed is at 15 cps or about 150 words per minute on all IBM mag card models. The MC/ST-I and CMC/ST are single-pitch machines which may be ordered with either a 10-pitch Pica or 12-pitch Elite character-per-inch font. The MC/ET employs a proportional mechanism where each character has its own unique spacing increment. The MT/ST-II and MC/A are dual-pitch machines offering the ability to be switched back and forth between 10- and 12-pitch character per inch fonts.

Maximum paper width accommodated by the typewriter carriages are 15½" for the MC/ST-I, CMC/ST and MC/ET; and 15-1/8" for the MC/ST-II and MC/A. "Writing" or print line width is 13" for the MC/ST-I and CMC/ST, and 12-5/6" on the MC/ET, MC/ST-II and MC/A. The memory-based MC/ST-II and MC/A have a normal default (adjust playback) mode which automatically sets up a 6" writing line. This line width may also be changed by the operator.

Each model has seven basic typewriter printer controls for multiple copy carriage control (settings of "A" to "E"); single or double line spacing; paper release; paper restraining bar; variable platen knob for line alignment changes; line release lever for temporary line adjustments; and a page-end indicator dial. The MC/ST-II and MC/A also have additional controls for dual-pitch selection.

Note that the IBM 46/40 Document Printer system (see Report S13-491-501) may also be used for the off-line (to the typewriter), high speed, playback printing of text from IBM mag card typewriter cards.

TEXT EDITING

GENERAL: IBM mag card Selectric typewriter system have the following edit capabilities.

MODEL	MC/ST-I	CMC/ST	MC/ET	MC/ST-II	MC/A
Automatic Paragraph Indent	Yes	Yes	Yes	Yes	Yes
Automatic Tabulation	Yes	Yes	Yes	Yes	Yes
Full Line Justification	No	No	No	No	No
Automatic Underlining	No	No	Yes	Yes	Yes
Backspace Correction	Yes	Yes	Yes	Yes	Yes
Control Character Printout	No	No	No	No	No
Direct Reverse Search	Yes	Yes	Yes	Yes	Yes

➤

IBM Mag Card Typewriters

MODEL	MC/ST-I	CMC/ST	MC/ET	MC/ST-II	MC/A
Document Assembly/Merge	No	No	No	Yes	No
Automatic Centering	No	No	No	Yes	Yes
Automatic Decimal Alignment	No	No	Yes	Yes	Yes
Automatic Tab Memory	No	No	No	No	No
Automatic Margin Adjust	Yes	Yes	Yes	Yes	Yes

DOCUMENT REVISION: The MC/ST-I, CMC/ST, MC/ET, and MC/ST-II can revise "on-line" by skipping text stored on the card and/or inserting material directly from the keyboard. For all systems but the MC/ST-II and MC/A, the length of data that can be inserted must not overflow 100 characters per line, or the difference between the existing line and 100 characters, whichever is less. Should more data insertion be required, a carryover to the next line must occur with overflow considerations taken into account for that line as well, etc.

The MC/ST-II operates directly out of its 8K character internal memory. Extensive text editing requires care only in case of overflow on the 8K character memory (note that when the memory is partitioned into 2 sections, the section boundary sets a smaller limit on the size of the document before overflow occurs). Upon completion of the text editing, the contents of internal memory can be dumped to one or more magnetic cards depending upon document length and page spacing requirements.

Revisions are accomplished on the MC/A by reading card text into the 6K character typewriter memory. The text is then played back on the typewriter, revised, and/or stored on another card for future use. Line lengths need not be respected since storage norms are by card and page.

TEXT SEARCH: The method employed with the mag card systems requires that a hard-copy (printed) reference book be maintained with a sample of each document that is stored on cards. Searches on the MC/ST-I, CMC, and MC/ET are performed by skipping (advancing) paragraphs, lines, words, or characters under operator control. On the MC/ST-II and MC/A, searches are performed by advancing by paragraph, line, word or character within a document after a card has been dumped into memory.

CORRECTION FEATURES: The MC/ST-II and MC/A employ a special mechanism which will simultaneously back up and clear data in memory, and erase the typed characters from the printed page. Erasures are virtually invisible with the special "lift-off" adhesive tape employed, allowing first draft copies to be used as final documents when no further changes are required. Each erasure tape will perform about 2000-character changes, and the carbon typewriter ribbon cartridge is good for over 120,000 impressions.

HYPEHNATION: A 6-character "hot zone" technique is used. Any word that starts 7 or more characters before the right-hand margin, and which will not end before the margin is reached, causes the system to stop in mid-word. The operator then allows typing to proceed character-by-character until a suitable place to hyphenate is reached. At this point the operator performs a hyphenation and returns the system to automatic typing mode. As an alternative to hyphenation, the operator can choose not to hyphenate by depressing the "auto" button when the unit stops in mid-word, and the full word will be typed. The oper may also choose to place extra hyphens in long word that more hyphenation will occur without oper intervention; unnecessary (non-required) hyphens wil dropped if they do not occur at the end of a line.

OTHER FEATURES: The MC/ST-II and the MC/A off Format Option which allows the operator to record s format functions as single or double spacing, clearing setting tabs, changing line lengths, and printing in adjus not adjust. The system will then place these function memory, change machine settings, and implement th whenever encountered. With this option, the operator enter format statements before printout via the keybo or a mag card.

CONFIGURATION

GENERAL: The elements in each system are a typewri I/O device, and a single-station magnetic card cons Options for each of the systems are enumerated in Equipment Price Listings.

Installations utilizing a number of IBM mag ca typewriters are also able to configure "shared capabilit systems by employing the IBM 46/40 Document Prin system (see Report S13-491-501). The Document Prin accepts IBM-formatted mag cards, and will provide hi speed printout from cards onto page or envelope stoc Thus, text keyboarding, editing and revision tasks may performed on IBM mag card "input/edit" typewriters, a final copy printout generated on the 46/40 Docume Printer.

IBM-formatted mag cards may also be fed into the IB Word Processor/32 system for more complex editing a formatting (see Report S13-491-401).

STORAGE MEDIUM

TYPE: All IBM mag card typewriters employ a flexible 3½ by 7-3/8" tab-size magnetic film card for text storage. Th MT/ST-II and MC/A, in addition, have internal typewrit memory capabilities.

CAPACITY: A mag card is formatted to store 50 lines (ca tracks) of 100 characters each, for a total per card capacit of 5000 characters. Based upon the maximum printabl writing line width and typewriter pitch size critera, th equates to a maximum line of 78 or 130 characters on th MC/ST-1 and CMC/ST; and a maximum line of 77 or 12 characters on the MC/ST-II and MC/A. The proportion spacing MC/ET has a 77 to 125 character line maximum dependent on the character mix (each individual characte occupies a different line space). Note that each space backspace, underline, carrier return, etc. instruction cod will occupy a character space on the mag card.

The internal MC/ST-II typewriter memory can hold up to 8000 characters of text. A dynamic boundary allows the operator to partition the memory into two sections (see ALT SECT Control Key function description). One section may be loaded with the body of a letter while the other contains variable address information, etc. A Switch code is used to implement automatic switching and card loading from the read/write unit stack feed for unattended automatic letter writing and similar tasks using this MC/ST-II memory feature.

The MC/A has a 6000 character memory that is used to store keyboarded text for eventual loading onto cards, or to receive recorded text from cards. The memory, however, may not be partitioned or used in Switch code type operations.

IBM Mag Card Typewriters

The MC/ST-II employs a pack feed plus single card feed mag card read/write module; the pack feed can process up to 50 mag cards. The MC/A employs a single card read/write module.

SPEED: Text transfer to and from read/write module and memory is 200 characters per second for the MC/ST-II. Text transfer on the MC/A is at 240 characters per second for card-to-memory dumps, and 200 characters per second for memory-to-card.

OPTIONS & AUXILIARY PERIPHERALS: IBM mag card typewriters may be equipped with a Reverse Index features that allows for half-line indexing upwards or downwards. This keyboard-implemented feature allows the generation of text containing super- or subscripts. The MC/ST-II and MC/A, in addition, may be equipped with a Format Option (described previously).

All mag cards prepared on IBM mag card typewriters may also be printed out on the IBM 46/40 Document Printer (see Report S13-491-101). This ink jet matrix printer generates typewriter-quality character copy at speeds of 77 to 92 characters per second in 10-pitch, 12-pitch and proportional-spaced fonts. The printer may be formatted via a mag card to automatically generate copy containing different pitch/proportional characters and type styles on letterhead, second sheet and envelope stocks.

The IBM Word Processor/32 (a special configuration of IBM's small business computer) may also be utilized with IBM mag card typewriters. Cards prepared on the mag card typewriters may be further edited or revised with the more powerful Word Processor/32 (see Report S13-491-401).

COMMUNICATIONS: Communications capability is provided for the CMC/ST only (the CMC/ST itself is an MC/ST-I plus a communications option). The communications feature turns the magnetic card station into a "casual" communications terminal able to communicate either with another CMC/ST, or directly with a suitably equipped IBM system/360 or 370 computer as well as compatible systems made by other manufacturers. The unit is recognized by the computer as an IBM 2741 Communications Terminal, and transmits data at the rate of 14.8 characters per second (135 baud). The communications feature integrally includes dial interface, receive interrupt, transmit interrupt, and Typamatic (repeating) keys. Special communications options (SER) include automatic terminal identification and communications mode key lock. In conjunction with the communications feature for computer-terminal operation, the user must provide a Bell equivalent 103G5 type modem. A point-to-point automatic answer capability is provided in conjunction with a 103 A2 modem for unattended operation.

PROGRAMMING: The IBM mag card typewriters are preprogrammed by IBM to accept edit command instructions as indicated by the operator through the control keys. The sequence of commands is stored with the text in appropriate positions on the magnetic cards for subsequent use in producing output. For the MC/ST-II and MC/A the edit commands are stored in internal "fluid" memory until transferred to magnetic cards.

PRICING

POLICY: IBM markets their mag card typewriters on a direct purchase, rental, or two-year Extended Term Lease (ETL) basis.

SUPPORT: IBM provides a self-instructional operator's manual with each mag card typewriter. If the mag card unit is part of an overall word processing operation, IBM will provide group training for supervisors at their Dallas, Texas facility. On-site training is also provided by an IBM Marketing Support Representative (MSR). In some instances, IBM will also offer branch office training for customer personnel (usually for the MC/ST-II). For other mag card units, the user should depend upon the self-teaching manual with initial installation demonstration and training support. This will be followed up by MSR calls and regular seminars at the IBM local office.

Maintenance costs are included in rental and lease charges; mag card units on purchase only require extra cost maintenance contracts. These basic maintenance plans cover normal working hour service calls on a Monday through Friday basis. Special customer enineering service is available at $34.50 per hour; overtime calls are billed at $45.00 per hour. ■

IBM Mag Card Typewriters

SPECIFICATIONS

MODEL	MC/ST-I	CMC/ST	MC/ET	MC/ST-II	MC/A
Power Required	115V, 60Hz, 2A	115V, 60Hz, 2A	115V, 60Hz, 2A	115V, 60Hz, 2A	115V, 60Hz, 2A
Typewriter Console					
H x W x D	7.1" x 20.5" x 15.6"	7.1" x 20.5" x 15.6"	7.1" x 20.3" x 15.6"	7.6" x 20.3" x 15.6"	7.6" x 20.3" x 1
Weight	50 lbs.	50 lbs.	50 lbs.	50 lbs.	50 lbs.
Mag Card Console					
H x W x D	32" x 10.5" x 20"	32" x 10.5" x 20"	32" x 10.5" x 20"	26.5" x 12" x 19"	26.5" x 12" x 19
Weight	75 lbs.	75 lbs.	78 lbs.	65 lbs.	64 lbs.

SUMMARY DATA

MODEL	MC/ST-I	CMC/ST	MC/ET	MC/ST-II	MC/A
Typewriter Model	975 Selectric	975 Selectric	965 Correcting Selectric	545 Correcting Selectric	545 Correcting Selectric
Announcement Date	October 1969	July 1971	April 1972	April 1973	September 1975
Auto Typing Speed	150 wpm	150 wpm	150 wpm	150 wpm	150 wpm
Storage Medium	Magnetic Card	Magnetic Card	Magnetic Card	Magnetic Card 8K Internal Memory	Magnetic Card 6K Internal Memor
No. Storage Stations	1	1	1	2*	1
Basic Mo. Lease**	$170	$225	$205	$275	$230
No. Installed***	75,000	9,000	9,000	35,000	7,000
Communications	Option (as CMC/ST)	Standard	None	None	None

**Card stack and single card feed ports. **Two-year term. ***Estimated installation figures; IBM does not release official installation statisti*

PRICING – Equipment

MODEL/ITEM	PURCHASE	MAINTENANCE* (per mo.)	RENTAL* (per mo.)	ETL LEASE* (per mo.)
MC/ST-I	$ 7,200	$25.00	$195.00	$170.00
CMC/ST**	9,550	33.00	255.00	225.00
MC/ET	7,850	36.00	235.00	205.00
MC/ST-II	12,390	42.00	310.00	275.00
MC/A	10,400	38.00	260.00	230.00
Auto Paragraph Indent***	N/C	1.50	N/C	N/C
Reverse Index	900	1.50	20.00	17.50
Format****	400	N/C	10.00	8.80
Selective Ribbon System***	140	N/C	5.00	4.50
Roll Paper Holder (one-time, single use charge)	80	N/C	N/A	N/A

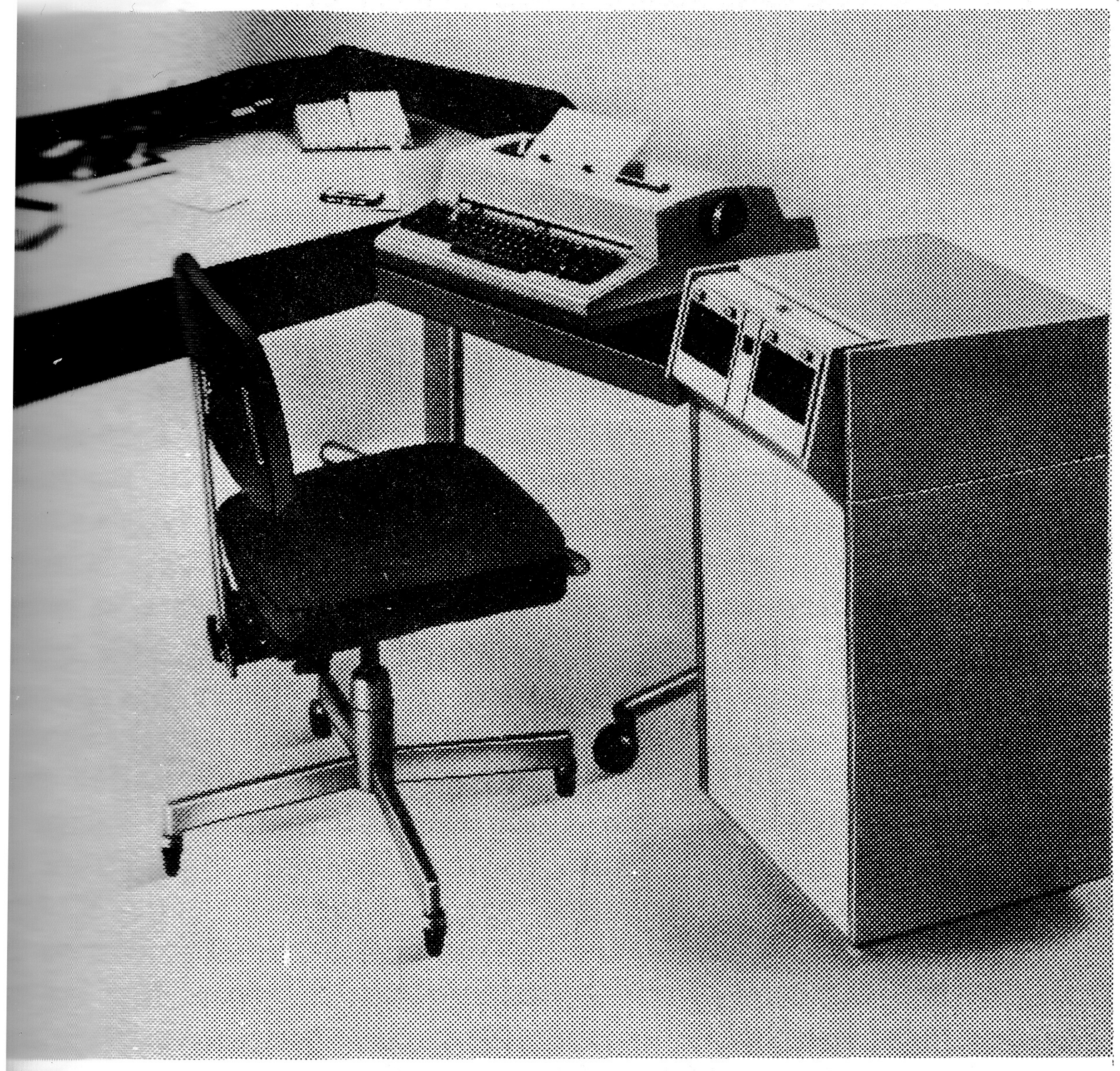
**Rental and 2-year ETL lease plans include maintenance. **Additional $1,463 charge when communicating capability field-installed on MC/ST-I. ***Standard feature of MC/ET, MC/ST-II and MC/A. ****Option only available on MC/ST-II and MC/A.*

PRICING – Supplies

MAGNETIC CARDS (Package of 25)

1 to 3 packages @ $31.00/pkg; 4 to 9 packages @ $25.00/pkg; 10 to 29 packages @ $23.75/pkg; 30 to 99 packages @ $22.50/pkg.

Redactron Magnetic Tape Editing Typewriter



Redactron's dual cassette tape editing typewriter can store [illegible]0,000 to 80,000 characters of text on either of the cassette tapes (right), while the heavy duty IBM Selectric (center) provides the basic keyboard/printer capability. This system is well designed for medium-to-long documents (5 to 50 pages) where extensive text editing is likely to occur.

Redactron's magnetic tape-based single or dual station automatic typewriters are classic examples of modern stand-alone typing systems. Strong communications support is provided for both models, and a powerful range of text editing commands is designed into the system to control data entry and printout functions. One of the most popular automatic typing systems, the Redactron units were widely distributed to Sperry Remington on an OEM basis for resale under Remington's name.

MANAGEMENT SUMMARY

Redactron's single and dual magnetic tape editing systems were part of the original lineup of equipment released by the company in 1971 as part of its initial thrust into word processing. the Redactron Magnetic tape systems use standard cassettes, and are based upon the heavy duty version of IBM's Selectric typewriter, giving the operator the same familiar typing feel as popular IBM Selectrics.

The single tape unit is designed to handle long documents (typically about 30 pages) that require a minimum of revision, where text insertions or changes will not affect more than two or three consecutive lines. For equally long documents where extensive text editing will be required, the dual tape model is much more convenient. On the dual model, the second tape station is used to produce an updated output tape reflecting the fully edited work. This makes it possible to extensively edit a tape and preserve the results of the edit on magnetic media. In the single media system, all editing will be permanently retained on tape and is limited to alterations within individual lines.

Following initial release of the original magnetic tape system in October, 1971, Redactron has introduced one major new version, and two important ancillary products designed to support the magnetic tape cassette in conjunction with the magnetic card media. They are the Dual Media Editing Typewriter (see the Redactron Dual

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CHARACTERISTICS

MANUFACTURER: Redactron Corporation, 100 Parkway Drive South, New York 11787. Telephone (516) 543-8700, or local offices and agents.

MODELS: Single Tape and Dual Tape (Series B).

TYPEWRITER

KEYBOARD: The Redactron Magnetic Tape Editing Typewriters use IBM's heavy duty 745 Selectric. Forty-four standard alphanumeric keys are provided with 86 different characters and space (both the period and the comma are repeated for upper and lower case), including upper and lower case alphabetics, and 34 numeric/special characters. By holding down the space bar, any letter, number, or special symbol can be used in a continuously repeating mode.

CONTROL KEYS: The Dual Tape system has seven basic typing control keys for margin release, tab, backspace, carrier return, lock, and two shift keys. In addition to typing controls, seven mode keys are located on the left side of the keyboard to control basic operations of: Record; Playback; Adjust (to adjust an irregular right hand margin during playback); Duplicate (to transfer information from one tape to another without playing out a typed copy); Edit (a playback mode in which a second tape is created to correct errors); IMT (Inhibit Mark Transfer can be used with Edit to eliminate the transfer of designated mark blocks of information); and Skip/Delete (skips material if used in Play or Adjust modes, or deletes material in Single Tape Editing).

Six positioning keys are used to control the motion of the tape reader/recorder and tell the system where to stop. They are: Character/Stop (stops at the next character); Word (in forward the reader stops after the next space, carrier return, or tab; in reverse the recorder stops at the first character of the preceding word); Line (in forward the reader/recorder stops on the next character after one carrier return; in reverse, on the character after the last carrier return); Find Mark (in forward moves the reader/recorder to the next section with a special Mark code; in reverse returns to the beginning of the tape); Paragraph (in forward only; stops at the first character of the next paragraph); and Auto (in forward only; stops at a Stop code or an Eject code).

Two keys are used in searching. Tens and Units that load the 2-digit Find Counter before a manual search for reference to a specific marked section.

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Media System report), and the tape Converter. For use in applications where interface between computer systems and the magnetic tape editing typewriters is desired, either a communications option or the Converter is available. The Converter can transfer the contents of a Redactron tape cassette to a ½ inch wide computer-compatible magnetic tape and vice versa. About a dozen of these systems have been delivered to date.

As originally released, the systems carried a "Series A" designation and were not equipped for communications to other Redactron units or to central computer systems. In September, 1973, the "Series B" was announced to provide communications support, automatic input centering, and search capability based upon content (i.e. strings of text) as well as by user-specified number or "mark" for lines or paragraphs. These changes have been implemented in an internal read-only memory (ROM) and the new Series B equipment is fully upward compatible with all existing "Series A" procedures and storage media. As of July 1, 1974 all "Series A" equipment has been officially discontinued.

One of the aspects of the Redactron systems is the marketing relationship between Redactron and Sperry-Remington, a competitor who had purchased their systems from Redactron for ultimate resale directly to end users. The equipment provided to Sperry-Remington consisted of the Series A versions of the single and dual tape systems (as well as the single and dual card units), less most of the optional features. As of July 1, 1974 Redactron's shipment of "kits" (baseplates and console innards) will cease, and Sperry-Remington will produce under license their own systems plus whatever modifications they choose at their Marietta, Ohio facilities. It is also interesting to note that Redactron has a strong commitment to the production of word processing hardware for use by other manufacturers in their own end-user systems. Redactron's magnetic tape cassette transports are well received in industry and among the well received in industry and among the well known firms using these transports are Graphic Systems, Inc. (a supplier to Singer), Photon and Mergenthaler, and Data General Corporation for use with their popular Nova minicomputers.

Redactron's main marketing thrust in the U.S. has been to market directly in the greater New York area, and in Chicago, Los Angeles, Boston, Atlanta, Washington, D.C., and Dallas. In addition, a nationwide network of about 90 sales agents represents the line on a consignment basis in the U.S. and Canada, with sales agreements signed directly between the end user and Redactron. As further support for prospective Redactron users, a media conversion service is provided to reformat IBM's MT/ST magnetic tape cartridges to Redactron's cassette format at no additional charge.

Users contacted by Datapro report that the Redactron magnetic tape systems are highly reliable and very well designed. Companies with light editing upon medium-to-long documents (5 to 50 pages) or with more exten-

Twenty-one standard keys are used in conju the Code Key to create and record edit comman magnetic tape that will subsequently control Without the simultaneous use of the Code Ke these keys cause immediate actions to take plac not create recorded format controls (hyphen, b return/carrier return, special carrier return, space). The standard keys used with the code key Required Hyphen; Continuous Underlining By-Word Underlining, End Underline; Stop C insert variable data or change the typing ball); C Line Code (to move from one line buffer–160 ters–to another without a carrier return on th copy; used when packing a tape to conserve tape End-of-Tape (to indicate end of the typed Alternate Code (allows the Redactor editing type alternate from one tape to another for variable tion); Repeat Code (directs the reader/recorder t to the first line of a marked document and playback of the tape; used in form letter oper Mark Code (to separate or section material); Spacing Code (to automatically change to doub ing); Single Spacing Code (to automatically ch single spacing); Print Control Key (to type co proofreading); Required Space; Required Carrier Special Carrier Return (to indicate a carrier retur typewriter without actually going to a new line tape; used when an operator wants to conserve spa tape); Required Special Carrier Return (used inste Required Carrier Return to conserve tape Required Backspace (used for special functions, auto tab); Automatic Tab (to tab automaticall every carrier return until the operator instructs a re the normal margin); Print Suppress Codes (to sta stop print suppress), and Go To Code (used in au searching of a specific marked section).

The Single tape model is identical to the Dual ta except that it does not have Alternate Code, Du functions, or Automatic Searching.

Two lights are provided on the keyboard. The Light indicates that the editing typewriter is in Rec Edit modes. The Backup Light indicates that the keys below the light will back up the typing posit the mag tape one character, one word, one line or beginning of the document (mark).

An Eject button and a Rewind button are position the tape console.

When the 160-character line buffer has only one cha space left during text entry, an audible "beep" t heard to signify only 1 space is left.

PRINTER: The printer used in the Redactron u based upon IBM's heavy duty replaceable Selectri typing element, and can produce typed output at 185 words per minute. The system is a "single-P machine, and can have either 10 (Pica) or 12 (character-per-inch horizontal spacing (selectable o time of order). The maximum paper width is 15-½ i with a 13-inch writing line. Carbon ribbon is availa an option.

Each model has six basic printer features for mu copy control (settings A-E), 5-position impression co lever, single or double spacing, paper release, pape straining bail, and platen variable knob for perma change of line position.

Optionally, the user may choose to output a Reda tape on a Versatec electrostatic printer at 9 seconds page (about 500 lpm). This printer, available at a co $9,700, produces draft-quality printout on spec

Redactron Magnetic Tape Editing Typewriter

editing, are well advised to investigage the single or dual tape Redactron systems. From an overall word processing systems point-of-view, Redactron is also well equipped to provide the right kind of system for shorter documents (magnetic card based) as well as computer communications interfaces and mixed media (card and tape) capability. □

treated paper at high speeds. It is particularly useful for generating proofreading copies, collated copies at high speeds (where its quality is acceptable), and high speed batch transfers (the tape produced at a receiving communicating typewriter is played back through the Versatec printer rather than at the keyboard typewriter). The unit is maintained by Versatec, with annual contracts available.

TEXT EDITING

GENERAL: The Redactron Magnetic Tape systems provide edit capability as shown below:

Model	Single Tape	Dual Tape
Automatic Paragraph Indent	Standard	Standard
Automatic Tabulation	Standard	Standard
Full Line Justification	None	None
Automatic Input Underlining	Standard	Standard
Backspace Correction	C.W.L. Mark	C.W.L. Mark
Control Character Printout	Standard	Standard
Direct Reverse Search	Standard	Standard
Document Assembly/Merge	None	Standard
Automatic Centering	Standard	Standard
Automatic Decimal Alignment	None	None
Automatic Tab Memory	Standard	Standard
Automatic Margin Adjust	Standard	Standard

DOCUMENT REVISION: The Single Tape system can revise "on-Line" by skipping text stored on the tape and/or inserting material directly from the keyboard. Correction while recording can be done by character, word, line, page, or full tape. On the single-tape system, all changes other than one-for-one character substitution require retyping an entire line. In dual tape systems revision material can be taken from the second tape as well as from the keyboard.

Note that in dual tape systems the right-hand station can be used for playback or record operations while the left station can be used for playback only.

TEXT SEARCH: The method used generally requires that a hard copy (printed) sample book be maintained with a copy of each text stored on the magnetic tape(s). Searches are performed by skipping characters, words, lines, or paragraphs (paragraph mode not provided for reverse). A Mark can also be recorded on the tape so that a Find Mark Search mode can be used to position to any Mark position either forward or reverse. Up to 99 Marks can be set anywhere on the tape by the operator. In Automatic mode, the system will play forward to a Stop or Eject code.

Using the content search capability, it is possible to avoid having to keep a hard copy record of the stored text. By entering a string of text (words, phrases, etc.) the system can search directly to the locations of the string(s) in the recorded media.

HYPHENATION: A 7-character "hot zone" technique is used whereby any word that starts more than 7 characters before the right hand margin, and which will not end before the margin is reached, causes the system to stop in midword as soon as the hot zone is reached. The operator then allows typing to proceed character-by-character until a suitable place to hyphenate is reached. At this time the operator performs a hyphenation, strikes the carrier return, and returns the system to Automatic typing mode. Additionally, if short words are read in the "hot zone", the system will look ahead again to make a tighter right-hand margin.

CONFIGURATION

GENERAL: The elements in either the single or dual tape system are a typewriter I/O device and a magnetic tape console. The typewriter fits on an existing desktop surface, while the tape console stands upright on the floor. Eight options are available (communications, content search, option program, reverse index, line finder, line counter, extended search, and Tech III ribbon mechanism), each of which are internal additions to the system.

STORAGE MEDIUM

TYPE: A standard Philips-type 200-foot long magnetic tape cassette is used for text storage. The tapes are recorded at 800 bpi on one side only.

CAPACITY: Each tape is used to store 60,000 to 80,000 characters (spaces, codes, and characters each occupy 1 character position on tape). As the tape is read or written, text is temporarily stored in a 160-character storage buffer. With the use of special carrier returns, required special character returns, and link codes, a maximum of up to 80,000 characters can be packed on a single tape.

SPEED: For dual tape systems, information can be duplicated from one tape to another at 700 characters per second.

AUXILIARY PERIPHERALS: No auxiliary peripherals are available for interconnection to the Redactron magnetic tape systems at this time. As an off-line, stand alone unit, a Converter is available to transfer text to/from ½-inch computer-compatible magnetic tape at 900 characters/second.

The Redactron cassette can be recorded with typesetting codes for playback on a compatible phototypesetter. Thus, any Redactron editing typewriter may also be used as an input device for photocomposition.

COMMUNICATIONS: An optional communications capability is provided that permits transmission at up to 300 characters per second to another similarly equipped Redactron magnetic card or tape system (Redactor Communicating Typewriter), an IBM Communicating Mag Card system teletypewriters, or large central computers. Three basic communications modes are supported: High-Speed Batch (Binary synchronous, EBCDIC or ASCII at 150, 225, 250, or 300 cps); Conversational (IBM Correspondence/IBM 2741 at 14.8 cps), and TWX/Telex (ASCII at 10 cps for TWX, or Baudot at 6.6 cps for Telex.)

PROGRAMMING: The Redactron single tape system is designed by Redactron to accept edit commands as indicated by the operator through control keys. The dual tape system has additional commands. The sequence of commands are stored with the text in appropriate positions on the magnetic tape for subsequent use in producing output.

PRICING

POLICY: Redactron provides the Magnetic Tape systems on a purchase basis, or on a one or two year rental plan. A

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Redactron Magnetic Tape Editing Typewriter

➤ purchase option is provided that applies 80 percent of the first six months rental toward purchase.

Redactron has instituted an Obsolescence Protection Program to provide the customer with protection against equipment up-dates that might make purchased equipment obsolete. This Program allows the user to enjoy the cost savings afforded by equipment purchase over equipment rental, without losing the flexibility of future system enhancements. The Program is now available to all purchasers of Redactron automatic typewriters at no additional cost (it previously cost $500, refundable if the user chose to retain the equipment). Users may trade up to any new Redactron system at any time; an amount equal to original purchase price minus equivalent rental cost will be credited to the new purchase. Redactron stresses that its equipment is designed with modular circuitry which can accept many new system features, so that it is likely that purchased Redactron equipment will be efficient and cost-effective over its useful lifetime.

SUPPORT: The Redactron Magnetic Tape systems are made available through a network of about 90 sales agents in the U.S. and Canada with international representation in Europe via Redactron International. Representation in Mexico and South America is through Floyd D. Ransom y Hijos A.A. de C.V. A media conversion program is available to convert IBM's MT/ST tape cartridges to Redactron's cassette format. Redactron handles the systems on a direct basis in the greater New York area, Chicago, Los Angeles, Boston, Atlanta, Washington, D.C., and Dallas. For the agent network, Redactron provides regional sales managers, field engineers, and marketing support representatives (MSR's). On all sales made by Redactron's agents, the contract is signed between the user and Redactron directly.

An Advice and Counsel software package to assist potential word processing users in evaluating their equipment needs is available from Redactron for $275. Purchasers of this package who subsequently decide to go with Redactron equipment receive a credit of $200 against equip purchases or $100 against rentals. An audio/visual gram is also available for training operators. This pac uses a La Belle projector (with foot pedal), available f Redactron at a cost of $440. The course for tape t writers is $1,360. An instructor's manual and kit is a able for $25. Each audio/visual course may be re- many times.

SPECIFICATIONS

MODEL	SINGLE	DUAL
Power Requirements		
Voltage	115V, 60 Hz	115V, 60 Hz
Current	10 A	10 A
Typewriter Dimensions (HxWxD)	7½"x21"x19½"	7½"x21"x19
Typewriter Weight	55 lbs	55 lbs
Console Dimensions	32"x15½"x7½"	32"x15½"x7
Console Weight	90 lbs	90 lbs

SUMMARY DATA

MODEL	SINGLE MAG TAPE	DUAL MAG TAPE
Typewriter Model	Selectric 745	Selectric 745
Announcement Date	July, 1971	July, 1971
First Shipment Date	October, 1971	October, 197
Automatic Typing Speed	185	185
Basic Storage Medium	Magnetic Cassette	Magnetic Cassette
No. Storage Stations	1	2
No. Units Installed	—	—
Communications	Yes	Yes
Edit Capability	Limited	Full

Redactron Magnetic Tape Editing Typewriter

EQUIPMENT PRICES

MODEL	PURCHASE	1-YR*	2-YR*	MAINT.
Single Tape Basic System (Series B)	$7,295	$200	$184	$38
Dual Tape Basic System (Series B)	8,870	285	258	46
BASIC SYSTEM OPTIONS				
Converter	15,100 to 19,400	445 to 510	–	65 to 75
Option Program	275	18	18	2
Content Search (requires Option Program)	200	16	16	2
Reverse Index (requires Option Program)	250	20	20	4
Line Finder (requires Option Program)	375	25	25	5
Line Counter	375	–	–	–
Film Ribbon	45	3	3	1
Tech III Ribbon	325	10	10	1
Noise Shield	5	N/A	N/A	0
COMMUNICATIONS OPTIONS**				
Conversational (C) [2741]	1,884	66	66	10
High Speed Batch (HSB) [2780]	2,253	79	79	10
HSB/C	3,192	127	127	15
TWX	1,811	65	65	10
Telex (No modem required)	1,325	52	52	10
HSB/Telex	2,654	106.50	106	15
HSB/TWX	3,119	125	125	15
TWX/C	2,315	93	93	12
Telex/C	2,285	91	91	15
HSB/TWX/C	3,630	145	145	17
Auto Answer	190	7	7	1
Station Identification	190	7	7	1
Remote Power Control (Unattended)	360	18	18	2
Modem Switch (202/201)	290	12	12	2
Remote Power Control plus Modem Switch	420	20	20	3
MEDIA				
Magnetic Tapes	9 each	–	–	–

* *Rental prices include maintenance.*

***Prices include modem; reduced prices available where user supplies modem.*

Redactron Redactor Magnetic Card Editing Typewriter

Redactron's dual magnetic card editing typewriter is shown here in a communications-oriented configuration. The typewriter can communicate with another Redactron magnetic card or tape unit, or with a large central computer system. Either of the card stations holds a 3¼-inch by 7 3/8-inch oxide-coated mylar film card capable of storing up to 10,240 characters of text. The typewriter is based upon the heavy duty version of the IBM Selectric. Purchase price for this system is about $10,000, depending upon specific communications options.

MANAGEMENT SUMMARY

When Redactron was organized by Evelyn Berezin and three other former Digitronics executives in 1969, the objective of the new organization was to develop and market a full line of stand alone, text editing systems. Thoroughly familiar with the IBM magnetic tape and card systems and having excellent computer backgrounds, the agressive young team put together one of the industry's earliest and most successful automatic typing product lines, featuring magnetic card as well as magnetic tape cassette based systems. It is interesting to note that "redact", as crossword puzzle fans well know, is a verb meaning "to edit" in some 17 languages.

The Redactron magnetic card systems use the same physical magnetic card storage media as IBM's popular MC/ST systems, but stores text in a different arrangement. This permits up to 10,240 characters to be contained on a card rather than 5000 as is the case for IBM. The Readactron unit is based upon IBM's heavy duty Selectric typewriter and thus has the same basic "feel" as the popular IBM electric. Redactron provides the system in either a single card version (as does IBM) or in a dual card version offering considerably greater text editing flexibility.

Following initial release of the original magnetic card systems in October, 1971, Redactron introduced several new versions and a number of ancillary units designed to provide an overall systems solution to certain major applications. One of these devices is a Converter that can accept ½-inch industry comparible magnetic tapes and

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The Redactron single or dual magnetic card systems use the same physical media as IBM's MC/ST equipment (storing twice as much data on the medium as IBM), and offers some of the industry's most powerful communications capabilities. With a keyboard based upon IBM's heavy duty Selectric typewriter, the Redactron unit offers the same basic "feel" as the standard office typewriter. A limited edit capability single-card version of the system is also available as a Power Typewriter.

CHARACTERISTICS

MANUFACTURER: Redactron Corporation, 100 Parkway Drive, South, Hauppauge, New York 11787. Telephone (516) 543-8700, or local offices and agents.

MODELS: Single Card and Dual Card (Series B).

TYPEWRITER

KEYBOARD: The Redactron Magnetic Card Editing Typewriters use IBM's heavy duty Selectric (745). Fortv-four standard alphanumeric keys are provided with 86 different characters and space (both the period and the comma are repeated for upper and lower case), including upper and lower case alphabetics, and 34 numeric/special characters. By holding down the space bar, any letter, number, or special symbol can be used in a continuously repeating mode.

CONTROL KEYS: The Dual Card system has seven basic typing control keys for margin release, tab, backspace, carrier return, lock, and two shift keys. In addiiton to typing controls, seven mode keys are located on the left side of the keyboard to control basic the operations of: Record; playback; Adjust (to adjust an irregular right hand margin during Playback); Duplicate (to transfer information from one card to another without playing out a typed copy); Edit (a playback mode in which a second card is created to correct errors); IMT (Inhibit Mark Transfer can be used with Edit to eliminate the transfer of designated mark blocks of information); and Skip/Delete (skips material if used in Play or Adjust modes or can delete material in Single/Card Editing).

Six positioning keys are used to control the motion of the card reader/recorder and tell the system where to stop. The keys are: Character/Stop (stops at the next character); Word (in forward the reader stops after the next space, carrier return or tab; in reverse the recorder stops at the first character of the preceding word); Line (in forward the reader recorder stops on the next character after one carrier return; in reverse, on the character after the last carrier return); Find Mark (in forward moves the reader/recorder to the next section with a special Mark code; in reverse returns to the beginning of the card); Paragraph (in forward only; stops at the first character of the next paragraph); and Auto (in forward only; stops at a Stop code or an Eject code).

Twenty standard keys are used in conjunction with the Code key to create and record edit commands on the magnetic card that will subsequently control format of the typed material. Without the simultaneous use of the

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transfer the contents to magnetic cards; it can also accept magnetic cards and produce a magnetic tape. The Converter includes a Pertec Corporation tape drive and sells for about $17,000. About a dozen of these systems have been delivered, and they are well suited for interfacing Redactron systems without communications options to computer systems. With communications (or via the Converter), the Readactron systems are suitable for use in large-scale office environments where the results of a computer run will be used to generate either correspondence (dunning letters for overdue accounts receivable) or lengthy text (management reports consisting of text interspersed with financial data produced by a computer).

Another ancillary product developed to support installed magnetic card systems is the Power Typewriter. This model is a single-card Redactron typing unit with severly restricted edit (almost limited to character replacement) and margin adjust capabilities used in conjunction with full powered editing card systems for straightforward low-revision, high-volume output typing of documents originally produced on a more powerful system. The Power Typewriter was released in April 1973 and sells for about $5,770.

It is also intersting to note that a dual-media system has also been developed by Redactron, in response to installed user requirements. The system contains both a magnetic card and a magnetic tape cassette unit. This unit offers the best elements of both types of media for certain applications.

In addition to the ancillary equipment announced after the introduction of the original systems, Redactron has also had one major planned enhancement to the magnetic card systems. As originally released, the systems carried a "Series A" designation and were not equipped for communications to other Redactron units or to central computer systems. In September, 1973 the Series B was announced to provide communications support, automatic input centering, and search capability based upon content (i.e. strings of text) as well as by user-specified number or "mark" for lines or paragraphs. These changes have been implemented in an internal read-only-memory (ROM). The new "Series B" equipment is fully upward compatible with all existing "Series A" procedures and storage media. As of July 1, 1974 all "Series A" equipment will have been officially discontinued.

One of the background aspects of Redactron systems is the marketing relationship between Redactron and Sperry-Remington, a competitor who had purchased their systems from Redactron for ultimate resale directly to end users. The equipment provided to Sperry-Remington consisted of the "Series A" versions of the single and dual card systems (as well as the single and dual tape units) less most of the optional features. As of July 1, 1974 Redactron's shipment of "kits" (baseplates and console innards) will cease, and Sperry-Remington will produce under license their own systems, plus

Code key, six of these keys cause immediate actions to take place but do not create recorded format controls (hyphen, backspace, return/carrier return, index/special carrier return, tab, and space). The standard keys used with the Code key include: Required Hyphen; Continuous Underling; Word-by-Word Underlining; End Underline; Centering; Stop Code (to insert viarable data or change the typing ball); Link Code (to move from one track to another without a carrier return on the typed copy; used when packing a card to conserve card space); Eject Code (to indicate end of a document); Alternate Code (allows the Redactor editing typewriter to alternate from one card to another for variable information); Repeat Code (directs the reader/recorder to return to the first track and repeat playback of the card, used in form letter operations); Mark Code (to separate or section material); Double Spacing Code (to automatically change to double spacing); Single Spacing Code (to automatically change to single spacing); Print Control Key (to type codes for proofreading); Required Space; Required Carrier Return; Special Carrier Return (to indicate a carrier return on the typewriter without actually going to a new track on the card, used when an operator wants to conserve space on a card); Required Special Carrier Return (used instead of a Required Carrier Return to conserve card space); Required Backspace (used for special uses, such as an auto tab); Print Suppress Codes (to start and stop Print Suppress) and Automatic Tab (to tab automatically after every carrier return until the operator instructs return to the normal margin).

The Single Card model is identical to the Dual Card unit except that it does not have Alternate Code or Duplicate functions.

Two lights are provided on the keyboard. The Record Light indicates that the editing typewriter is in Record or Edit modes. The Backup Light indicates that the action keys below the light will back up the mag card one character, one word, one line or to the beginning of the page (mark).

PRINTER: The printer used in Redactron units is based upon IBM's heavy duty replaceable Selectric ball typing element, and can produce typed output at up to 185 words per minute. The system is a "single-Pitch" machine and can have either 10 (Pica) or 12 (Elite) character-per-inch horizontal spacing (selectable only at time of order). The maximum paper width is 15-½ inches with a 13-inch writing line. Carbon ribbon is available as an option.

Each model has six basic printer features for multiple copy control (settings A-E), a 5-position impression control lever, single or double spacing, paper release, paper restraining bail, and platen variable knob for permanent change of line position.

TEXT EDITING

GENERAL: The Redactron Magnetic Card systems provide edit capability as shown below:

MODEL	SINGLE CARD	DUAL CARD
Automatic Paragraph Indent	Standard	Standard
Automatic Tabulation	Standard	Standard
Full Line Justification	None	None
Automatic Input Underlining	Standard	Standard
Backspace Correction	C,W,L, Page	C,W,L, Page
Control Character Printout	Standard	Standard

whatever modifications they choose, at their Marietta, Ohio facilities. It is also interesting to note that Redactron has a strong commitment for the production of word processing hardware for use by other manufacturers in their own end-user systems. Redactron's magnetic card transports are well received in industry and among the well know firms using these transports is Omnitext, one of Redactron's competitors in the word processing market.

Redactron's main marketing thrust in the U.S. has been to market directly in the greater New York area, and in Chicago, Los Angeles, Boston, Atlanta, Washington, D.C. and Dallas. In addition, a nationwide network of about 90 sales agents represents the line on a consignment basis in the U.S. and Canada, with sales agreements signed directly between the user and Redactron.

Redactron's product planning efforts have incorporated both a phased release of new capabilities (Series B), as well as specific ad hoc responses to major customer requirements (Power Typewriter, Dual Media system, and Converter unit). In spite of the strong technical capabilities of the company, engineering breakthroughs for their own sake have been held back, product releases controlled almost exclusively by marketing decisions.

Users contacted by Datapro report that the Redactron magnetic card systems are highly reliable and very well designed. Companies with light editing correspondence (1-3 pages) or more extensively edited typing such as longer correspondence or memoranda are well advised to investigate the single or dual card Redactron systems. From an overall word processing systems point-of-view, Readactron is also very well equipped to provide the right types of support equipment for repetitive (power) typing as well as computer interface and mixed media capability. □

➤ MODEL	SINGLE CARD	DUAL CARD
Direct Reverse Search	Standard	Standard
Document Assembly/Merge	None	Standard
Automatic Centering	Standard	Standard
Automatic Decimal Alignment	None	None
Automatic Tab Memory	Standard	Standard
Automatic Margin Adjust	Standard	Standard

DOCUMENT REVISION: The Power Typewriter system can revise "on-line" by skipping text stored on the card and/or inserting material directly from the keyboard. Correction while recording can be done by character, word line (physical line on the card rather than logical typed line on hard copy taking adjusted margins into account), or full card. On the single-card system, all changes other than one-for-one character substitution require retyping the entire line. In Dual Card systems revision material can be taken from the second card as well as from the keyboard.

TEXT SEARCH: The method generally used requires that a hard copy (printed) sample book be maintained with a copy of each text stored on the magnetic card(s). Searches are performed by skipping characters, words, lines, or paragraphs (paragraph mode not provided for reverse). In Automatic mode, the system will play forward to a Stop or Eject code. In addition, the manual track Selector Button on the media console can be used to position the card(s) to any desired line. A track indicator on the console indicates the number of the track being read or written. Using the content search capability, it is possible to avoid having to keep a hard copy record of the stored text. By entering a string of text (words, phrases, etc.) the system can search directly to the location(s) of the string(s) in the recorded media.

HYPHENATION: A 7-character "hot zone" technique is used whereby any word that starts more than 7 characters before the right hand margin, and which will not end before the margin is reached, causes the system to stop in midword.

The operator then allows typing to proceed character-by-character until a suitable place to hyphenate is reached. At this time the operator performs a hyphenation, strikes the carrier return, and returns the system to the Automatic Typing mode. Additionally, if short words are read in the "hot zone", the system will look ahead again to make a tighter right hand margin.

CONFIGURATION

GENERAL: The elements in either the single or dual card systems are a typewriter I/O device and a magnetic card console. The typewriter fits on an existing desktop surface, while the card console stands upright on the floor. Six options are available (communications, content search, option program, reverse index, line finder, line counter, and Tech III ribbon mechanism), each of which are internal additions to the system.

STORAGE MEDIUM

TYPE: A flexible 3-½ x 7 3/8 inch magnetic film card is used for data storage. The dimensions of the card are identical to those of the standard computer punched tab card.

CAPACITY: Each card stores 64 lines (tracks) with 160 characters per line for a total capacity of 10,240 characters per card. Where backspaces or underling are required, only two additional characters on the same card line are required to express the functions. Recording density on the magnetic card is 27 characters or codes per inch.

SPEED: For dual card systems, information can be duplicated from one card to another at about 300 characters per second.

AUXILIARY PERIPHERALS: No auxiliary peripherals are available for interconnection to the Redactron magnetic card systems at this time. An an off-line stand alone unit, a Power Typewriter (limited to minor editing and virtually no margin adjustment) and a Converter (to transfer text to/from ½ inch computer-compatible magnetic tape at 300 characters/second) are available.

The Redactron cassette can be recorded with typesetting codes for playback on a compatible phototypesetter. Thus, any Redactron editing typewriter may be used as an input device for photocomposition. Magnetic cards must be converted to cassette tape (on a Dual Media Editing Typewriter) in order to make use of this option.

COMMUNICATIONS: An optional communications capability is provided that permits transmission at up to 300 characters per second to to another similarly equipped Readactron magnetic card or tape system (called a Redactor Communicating Typewriter), an IBM Communicating Mag Card system, teletypewriters, or central computers. Three basic communications modes are supported: High-Speed Batch (Binary synchronous, EBCDIC or ➤

ASCII at 150, 225, 250, or 300 cps); Conversational (IBM Correspondence/IBM 2741 at 14.8 cps); and TWX/Telex (ASCII at 10 cps for TWX, or Baudot at 6.6 cps for Telex.)

PROGRAMMING: The Redactron single card system is designed by Redactron to accept edit commands as indicated by the operator through control keys. The Dual Card system has additional commands. The sequence of commands are stored with the text on the magnetic-card for subsequent use in producing output.

PRICING

POLICY: Redactron provides Magnetic Card systems on a purchase basis, or on a one or two year rental plan. A purchase option is provided that applies 80 percent of the first six months rental toward purchase.

Redactron has instituted an Obsolescence Protection Program to provide the customer with protection against equipment up-dates that might make purchased equipment obsolete. This Program allows the user to enjoy the cost savings afforded by equipment purchase over equipment rental, without losing the flexibility of future system enhancements. The Program is now available to all purchasers of Redactron automatic typewriters at no additional cost (it previously cost $500, refundable if the user chose to retain the equipment). Users may trade up to any new Redactron system at any time; an amount equal to original purchase price minus equivalent rental cost will be credited to the new purchase. Redactron stresses that its equipment is designed with modular circuitry which can accept many new system features, so that it is likely that purchased Redactron equipment will be efficient and cost-effective over its useful lifetime.

SUPPORT: The Redactron Magnetic Card systems are made available through a network of about 90 sales agents in the U.S. and Canada with international representation in Europe via Redactron International. Representation in Mexico and South America is through Floyd D. Random y Hijos S.A. de C.V. A media conversion program is available to convert IBM's MC/ST cards to Redactron's format. Redactron handles the systems on a direct basis in the greater New York area, and in Chicago, Los Angeles, Boston, Atlanta, Washington, D.C., and Dallas. For the agent network, Redactron provides regional sales managers, field engineers, and marketing support representatives (MSR's). On all sales made by Redactron's agents, the contract is signed between the user and Redactron.

An Advice and Counsel software package to assist potential word processing users in evaluating their equipment needs is available from Redactron for $275. Purchasers of this package who subsequently decide to go with Redactron equipment receive a credit of $200 against equipment purchases or $100 against rentals. An audio/visual program is also available for training operators. This package uses a La Belle projector (with foot pedal), available from Redactron at a cost of $440. The course for card typewriters is $1,190. An instructor's manual and kit is available for $25. Each audio/visual course may be re-used many times.

SPECIFICATIONS

MODEL	SINGLE CARD	DUAL CARD
Power Requirements		
Voltage	115V, 60 Hz	115V, 60 Hz
Current	10 A	10 A
Typewriter Dimensions	7¼"x21"x19½"	7¼"x21"x19½"
Typewriter Weight	55 lbs	55 lbs
Console Dimensions	32"x15½"x7½"	32"x15½"x7½"
Console Weight	90 lbs	90 lbs

PRICING

	PURCHASE	RENTAL 1-YEAR	MAINT.
Power Typewriter	$ 5,770	$173	$32
Converter	15,400 to 19,700	450 to 580	65 to 75
Magnetic Cards			
1-3 Boxes*	26.25 ea.		
4-9 Boxes*	21.25 ea.		
10-29 Boxes*	20.00 ea.		

**25 magnetic cards plus holders per box.*

SUMMARY DATA

MODEL	SINGLE MAG CARD	DUAL MAG CARD	POWER TYPEWRITER
Typewriter Model	Selectric 745	Selectric 745	Selectric 745
Announcement Date	July, 1971	July, 1971	April, 1973
First Shipment Date	October, 1971	October, 1971	—
Automatic Typing Speed	185 wpm	185 wpm	185 wpm
Basic Storage Medium	Magnetic Card	Magnetic Card	Magnetic Card
No. Storage Media Stations	1	2	1
Number Installed	—	—	—
Communications	Yes	Yes	None
Edit Capability	Limited	Full	None

Redactron Redactor Magnetic Card Editing Typewriter

MODEL	PURCHASE	1-YR*	2-YR*	MAINT.
Single Card Basic System (Series B)	$7,295	$200	$184	$38
Dual Card Basic System (Series B)	8,870	285	258	46
BASIC SYSTEM OPTIONS				
Option Program	275	18	18	2
Content Search (requires Option Program)	200	16	16	2
Reverse Index (requires Option Program)	250	20	20	4
Line Finder (requires Option Program)	375	25	25	5
Line Counter	375	—	—	—
Film Ribbon	45	3	3	1
Tech III Ribbon	325	10	10	1
Noise Shield	5	N/A	N/A	0
COMMUNICATIONS OPTIONS**				
Conversational (C) [2741]	1,884	66	66	10
High Speed Batch (HSB) [2780]	2,253	79	79	10
HSB/C	3,192	127	127	15
TWX	1,811	65	65	10
Telex (No modem required)	1,325	52	52	10
HSB/Telex	2,654	106	106	15
HSB/TWX	3,119	125	125	15
TWX/C	2,315	93	93	12
Telex/C	2,285	91	91	15
HSB/TWX/C	3,630	145	145	17
HSB/Telex/C	3,750	150	150	17
Auto Answer	190	7	7	1
Station Identification	190	7	7	1
Remote Power Control (Unattended)	360	18	18	2
Modem Switch (202/201)	290	12	12	2
Remote Power Control plus Modem Switch	420	20	20	3

* *Rental prices include maintenance.*

***Prices include modem; reduced prices available where user supplies modem.* ■

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